

DEC STD 162-0 Micrographics: Format and Quality Requirements for Microfilm

DOCUMENT IDENTIFIER: A-DS-EL00162-00-0000 Rev C2, 24-Aug-1992

ABSTRACT: This standard describes the general format and quality requirements for each type of microfilm produced for Digital Equipment Corporation. The requirements are based on appropriate industry standards, such as American National Standard Institute (ANSI), Association of Information and Image Management (AM) and U.S. Government specifications that have been adopted by the Digital Micrographics Committee.

APPLICABILITY: This standard applies to all organizations within Digital that are presently using any form of micrographics or any organizations that propose to use any form of micrographics in the future.

STATUS: APPROVED 24-Aug-1992; use VTX SMC for current status.

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REVISION HISTORY:	Rev A,	07-Dec-1978	
	Rev B,	23-Oct-1981	ECO Number MLO01
	Rev C,	07-Mar-1988	ECO Number CTS02
	Rev C1,	26-Jun-1989	ECO Number CTS03
	Rev C2,	24-Aug-1992	ECO Number NRO04

Document Management Category:	Micrographics (TTM)
Responsible Department:	Corporate Micrographics/Image Information System
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APPROVAL: This document has been updated with clerical changes only. The previous revision was recommended for approval by the DEC STD 162 committee and the General Review Group for its category.

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1 INTRODUCTION

Microfilm is a highly developed and specialized class of photographic film used to accurately reproduce, in reduced size, original documents or computer-generated data. Some of its major advantages are listed below.

- a. **Saves Space**—Because quantities of information can be compacted on microfilm in easily managed, standardized formats, space requirements may be reduced by as much as 98 percent.
- b. **Saves Money**—The cost of microfilm is only a fraction of that of paper or magnetic media carrying the same information. Its small size also means reduced storage space and costs; and can result in savings in filing and retrieval time and substantial savings in postage.
- c. **It's Secure**—Microfilm is easily and inexpensively duplicated. The original microform masters (created from paper documentation, fiche/film created from magnetic tapes) are always secure. Users are given film or paper copies of needed material. The silver master is stored at a secure location in a temperature and humidity controlled environment. The masters can always be retrieved for duplication in case of loss, or need for additional copies.
- d. **It's Current**—It provides instant information. Because of microfilm's low cost, master copies of any frequently changing record can be updated and new filmed copies made and distributed to users, who then dispose of their outdated film.
- e. **It's Speedy**—Microfilm's small size and compact nature puts vast amounts of information at the user's fingertips. Volumes can be scanned automatically in seconds. Random lookup of data is simple.

NOTE

Microfilming may not be financially applicable for records with low volume or short-term retention periods.

1.1 PURPOSE

The purpose of this standard is to establish the general format and quality requirements that apply to each type of microform used by Digital. It is intended for use as a reference by those organizations within the corporation that utilize microform products, either for sale to customers or for use by groups within Digital.

1.2 SCOPE

The requirements for microform characteristics and production practices at Digital are generally consistent with those of the micrographics industry, as documented by the Association for Information and Image Management (AIIM), American National Standards Institute (ANSI), and relevant government endorsed standards. This standard references appropriate industry or government standards and provides specific information only where the requirements for Digital-utilized microforms differ from those in adopted standards.

1.3 RESPONSIBILITIES

It is the responsibility of each organization within Digital who supply microforms to comply with the requirements of this standard. Those organizations that prepare and submit source documentation and/or magtape to outside microform vendors are responsible for assuring that vendor supplied microforms meet the requirements of this standard.

The DEC STD 162 committee strongly urges that all departments using microform conform to the requirements stated in this standard.

Two microform technologies, "dry silver" and "updatable," do not meet Digital, industry, or American National Institute's standards. If a department determines that one of these methods is the only one that will meet their needs, they must submit a written request to the DEC STD 162 committee for permission to use them. The request should include the following.

- a. An explanation of the requested change
- b. The reason for submitting the change request
- c. A financial analysis of the proposed or current nonstandard system
- d. Documentation stating that Digital's record retention responsibility is being met on all information that Digital is required to maintain
- e. Plans regarding future compliance with the current requirements, such as migration to current microform standards

2 MICROFORM QUALITY REQUIREMENTS AND CHARACTERISTICS

The following categories of microforms are produced for various organizations within Digital.

- Microfiche from hard copy (source)
- Roll microfilm from hard copy (source)
- Cartridges using roll microfilm
- 35mm aperture card from Engineering drawings and documentation
- Computer Output Microfilm (COM) generated versions of all the above categories

The industry and government-endorsed standards, which have been adopted as the Digital standard format for each type of microform, are specified in the following paragraphs. Terminology used in these paragraphs is in accordance with the AIIM TR2-1992, *Glossary of Micrographics*. For latest revisions, refer to:

ANSI, INC. (American National Standards Institute), 1430 Broadway, New York, N.Y. 10018

AIIM (Association for Information & Image Management), 1100 Wayne Ave., Suite 1100, Silver Spring, MD 20910

2.1 MICROFICHE

The general format requirements for microfiche are described in the ANSI/AIIM MS5-1991, *The Users Guide to Standard Microfiche Formats*. Refer to Table 1, *Microfiche Formats*, for a summary of the general Microfiche formats. The reductions, as listed in Table 1, are effective reductions that are fixed when applied to COM systems. For source documentation applications, the listed reductions are considered maximums.

Microfiche utilized by Digital will comply with the requirements of ANSI/AIIM MS5-1991.

This standard specifies requirements for the following.

- Physical characteristics of the microfiche
- Types of microfiche, including size and the orientation of frames and microimages
- Reduction
- Heading, pagination, frame identification and cutting work

Table 1: Microfiche Formats

Arranged for	Reduction	Columns	Rows	Number of Frames		Use
				8-1/2 x 11	11 x 14	
8-1/2 x 11 inches	24X	14	7	98	49*	Documents or COM
11 x 14 inches	24X	9	7	63	63	Documents or COM
17 x 11 inches	24X	7	7		49	Documents or COM
8-1/2 x 11 inches	42X	25	13	325	156*	COM
11 x 14 inches	42X	16	13	208	208	COM

* A single image occupies two frames.

2.1.1 Density

Density of hard copy (source) document microforms (first generation) shall be read in accordance with ANSI IT2.19-1990, *Photography Density Measurements/Geometric Conditions for Transmission Density*.

Density of full reversal processed Computer Output Microforms (COM) shall be in accordance with ANSI IT2.19-1990. See subhead 2.5.1 of this document for specifics.

2.1.2 Resolution

Resolution on film should exceed 90 line pairs per millimeter for hard copy (source) documentation microforms. For COM see subhead 2.5.2 of this document for specifics.

2.1.3 Microfiche Resolution Exception

Micro published material in microfiche is not required to have the test target used for resolution quality control purposes. However, the use of test targets is encouraged by the DEC STD 162 committee.

Example 1: Microfiche¹

NOTE 1

Refers to material reproduced from a brochure titled *Paper Proliferation Spells Paper Pollution* by permission from AIIM (used in Examples 1 through 5).

2.2 ROLL MICROFILM

Roll microfilming (16mm and 35mm) for non-aperture card applications may follow any industry standard practices consistent with requirements for the specific application. Image orientation of cine, comic, duo, duplex and four track are included.

When on-film indexing is used, document mark placement will conform to the dimensions and density of the document mark requirements as stated in ANSI/AIIM MS8-1988, *Image Mark (Blip) Used in Image Mark Retrieval Systems*. Code line indexing will conform to manufacturers' standards for the retrieval and equipment specified in the application. Other proprietary on-film indexing, such as "Oracle," will conform to equipment manufacturers' specifications.

Flash targets may be used. Their placement will be determined by the applications requirements.

This standard specifies requirements for the following.

- Nonperforated 16mm and 35mm applications.
- Microfiche applications.

2.2.1 Density

Density of hard copy (source) document microforms (first generation) shall be read in accordance with ANSI IT2.19-1990.

Density of full reversal processed Computer Output Microforms (COM) shall be in accordance with ANSI IT2.19-1990. See subhead 2.5.1 of this document for specifics.

2.2.2 Resolution

Resolution on film should exceed 90 line pairs per millimeter for hard copy (source) documentation microforms. For COM see subhead 2.5.2 of this document for specifics.

Example 2: Roll Microfilm ¹

2.3 CARTRIDGES

A cartridge is a light proof container of rigid plastic (or metal) that houses processed microfilm that is designed for insertion into readers and reader printers. These devices protect the film from fingerprints, dirt and dust, and other sources of damage. Their primary use is for heavily accessed rolls of film.

Example 3: Microfilm Cartridges/Cassettes ¹

2.4 MICROFILM APERTURE CARDS

Aperture card microfilming will comply with the requirements of the following specifications /standards.

- MIL-M-98681A, *Requirements for Microfilming Engineering Documents 35mm*
- MIL-C-9877B, *Cards, Aperture*
- MIL-C-9949, *Cards, Copy*

These documents specify the general format of the microfilm and the dimensions of the various aperture card types. Standard procedures and practices for aperture card coding, image locations and orientation are described in *DEC STD 185-1 Requirements for Releasing Unigraphics Data Bases*.

Example 4: Microfilm Aperture Cards ¹

2.5 COMPUTER OUTPUT MICROFILM (COM)

The format (see Table 1) and coding for the computer output microfilm will comply with the requirements of ANSI/AIIM MS1-1988, *Recommended Practice for Alphanumeric Computer Output Microforms - Operational Practices for Inspection and Quality Control*.

The quality control requirements for the computer output microfilm shall be in accordance with ANSI/AIIM MS1-1988.

The processed film is subjected to the thiosulphate content measurement control guidelines as outlined in ANSI PH4.8-1985, *Photography (Chemicals) - Residual Thiosulphate and Other Chemicals in Films, Plates and Papers - Determination and Measurement*.

2.5.1 Density

The correct density depends upon the process that you are using. For silver based film chemically processed, the density guidelines are:

- | | | |
|-------------------------|---|---|
| Conventional processing | - | DMAX 0.75 (minimum) |
| | - | DMIN 0.10 + base and fog (maximum) |
| | - | Minimum density difference DMAX to DMIN is 0.60 |
| Reversal processing | - | DMAX 1.5 or greater (minimum) |
| | - | DMIN 0.20 + base and fog (maximum) |
| | - | Minimum density difference DMAX to DMIN 1.3 |

The minimum DMAX levels are acceptable only if the film used has sufficient granularity to produce a quality product.

For the full reversal system to perform adequately, the density variation between the background and the image must be sufficient and the density variation on the image must be stable.

See ANSI/AIIM MS1-1988.

2.5.2 Resolution

The resolution required is dependent upon the information recorded and the reduction used. If the lower case letters are used, or the generation being used is beyond the second generation, the first generation requirements are greater.

Reproducibility becomes significant. Test the system to determine if it will meet the needs of the user. Create hard copy to determine that there is sufficient printability to enable the users access to legible copy.

Example 5: Computer Output Microfilm (COM) ¹

3 PRODUCTION AND QUALITY CONTROL REQUIREMENTS

The reference standards, specifications, and specific practices required for the production and quality control of microforms are described in ANSI/AIIM MS1-1988, *Recommended Practice for Alphanumeric Computer Output Microforms - Operational Practices for Inspection and Quality Control*.

The microform production methods and quality control procedures required in this standard represent the general requirements, not the specific practices that each organization may need to do the job. It is expected that the microform users within Digital will develop and document any standard operating procedures they determine necessary to comply with the requirements stated in this standard. Such documentation is to be maintained and kept up-to-date by the originating organizations.

3.1 PROCESSED FILM THIOSULPHATE CONTENT

Processed camera film shall comply with ANSI PH4.8-1985. General business documentation microfilm can be sample-tested using a MIL-STD 105D, *Microfiche Grid Gauge* or an equivalent statistical sampling plan.

3.2 INTERNAL REVENUE SERVICE STANDARD/RECORDS RETAINED ON MICROFILM

Agency: Department of the Treasury Internal Revenue Service
Code: US 320-0030-00
Citation: Revenue Ruling 81-46

Refer to the above agency, code, citation numbers, for further information for IRS Microfilm rulings.

Corporate Policy adheres to these procedures.

3.3 CORPORATE MICROGRAPHICS ASSISTANCE

Digital has a Corporate Micrographics Department in Northboro, MA, that serves all Digital locations in the conversion of paper to micrographic systems in any of its many formats. This includes engineering, manufacturing, or business applications. Conversion and consulting services are available.

Should a department or division of Digital choose to undertake any system of micrographics on their own, any services purchased or proposed must conform to this standard. For all micrographics requirements, call the above Corporate group for assistance.

3.4 SECURITY RESPONSIBILITIES

It is the responsibility of any Digital department that undertakes a micrographics conversion program to ensure that the master silver negatives are stored in a humidity and temperature controlled environment, with adequate protection for fire suppression.

4 MICROGRAPHICS SERVICES EQUIPMENT AND MATERIALS

Services, equipment and materials purchased for use in micrographics applications by Digital will conform to the following general requirements.

- a. Production equipment used to create or duplicate microforms will provide a product that meets Digital and industry standards for formats and size.
- b. Materials used in the production of micrographics systems will, in their final form, conform to Digital and industry standards.
- c. Only high-quality silver films will be used for original records - both in source document microfilming and COM production. (Dry silver imaging processes will not be used for permanent records retentions).
- d. Micrographic readers and hard copy output devices (reader/printers) purchased will use Digital and industry standard microform sizes and formats.

APPENDIX A REFERENCED DOCUMENTS

A.1 EL-Class Digital Documents

EL-Class Number	Document Title
EL-00185-01	<i>DEC STD 185-1 Requirements for Releasing UNIGRAPHICS Data Bases</i>

Use VTX SMC to order copies of EL-class documents from Standards and Methods Control. Send distribution questions to JOKUR::SMC or call DTN: 234-4423.

A.2 Other Documents

Document Number	Document Title
AIIM TR2-1992	<i>Glossary of Micrographics</i>
ANSI IT2.19-1990	<i>Photography Density Measurements/Geometric Conditions for Transmission Density</i>
ANSI PH4.8-1985	<i>Photography (Chemicals) - Residual Thiosulphate and Other Chemicals in Films, Plates and Papers - Determination and Measurement</i>
ANSI/AIIM MS1-1988	<i>Recommended Practice for Alphanumeric Computer Output Microforms - Operational Practices for Inspection and Quality Control</i>
ANSI/AIIM MS23-1991	<i>Practice for Operational Procedures/Inspection or Quality Control of First Generation Silver Gelatin Microfilm Documents</i>
ANSI/AIIM MS5-1991	<i>The Users Guide to Standard Microfiche Formats</i>
ANSI/AIIM MS8-1988	<i>Image Mark (Blip) Used in Image Mark Retrieval Systems</i>
MIL-C-9877B	<i>Cards, Aperture</i>
MIL-C-9949	<i>Cards, Copy</i>
MIL-M-98681A	<i>Requirements for Microfilming Engineering Documents 35mm</i>
MIL-STD 105D	<i>Microfiche Grid Gauge / Paper Proliferation Spells Paper Pollution</i>

A.3 Ordering Information

Following are the sources for documents not available from Standards and Methods Control.

- ANSI, IEC, and ISO Documents
American National Standards Institute (ANSI),
1430 Broadway, New York, NY 10018,
Telephone (212) 354-3300 x479
- AIIM (Association for Information & Image Management) documents are available from:
1100 Wayne Ave.
Suite 1100
Silver Spring MD 20910
The brochure *Paper Proliferation Spells Paper Pollution* is available from AIIM.
- Federal Standards, Military Standards, Naval Publications, and Forms Center:
5801 Tabor Avenue
Philadelphia, PA 19120
Telephone (215) 697-3321

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